

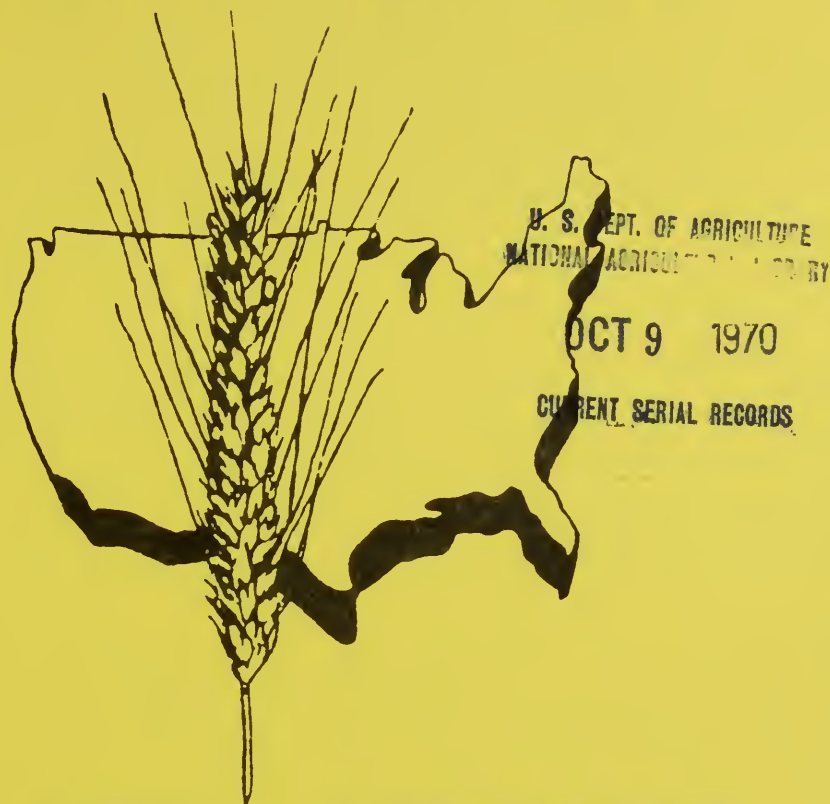
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# DURUM WHEAT



## QUALITY REPORT

Physical, Chemical, Milling, and Macaroni Characteristics

1966 CROP

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
CROPS RESEARCH DIVISION  
and  
NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION  
DEPARTMENT OF CEREAL TECHNOLOGY



UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Service  
Crops Research Division

and

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION  
Department of Cereal Technology

Preliminary Report not for Publication<sup>1/</sup>

QUALITY EVALUATION OF DURUM WHEAT VARIETIES

1966 CROP<sup>2/</sup>

by

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<sup>1/</sup> This is a progress report of cooperative investigations containing data, the interpretation of which may be modified with additional experimentation. Therefore, publication, display, or distribution of any data or statements herein should not be made without written approval of the Crops Research Division, ARS, USDA, and the cooperating agencies concerned.

<sup>2/</sup> Cooperative investigations of the Crops Research Division, ARS, USDA, and the Department of Cereal Technology, North Dakota State University. The samples were obtained from the cooperative experiments with the State Agricultural Experiment Stations in the durum wheat region.

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Spring and Durum Wheat Quality Laboratory  
Fargo, North Dakota  
CR-32-67  
April 1967

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197	198	199	200

## COOPERATING AGENCIES, STATIONS, AND PERSONNEL

The cooperating agencies, stations, and personnel conducting the varietal plot and nursery experiments concerned with these durum tests in 1966 were as follows:

### Minnesota Agricultural Experiment Station

Crookston, Morris, and St. Paul: R. E. Heiner\*, F. K. Johnson, D. R. Johnston, and Roy Thompson.

### Montana Agricultural Experiment Station

Bozeman, Creston, Havre, Huntley, Moccasin, and Sidney:  
F. H. McNeal\*, M. A. Berg\*, H. R. Guenther, G. P. Hartman,  
D. E. Baldrige, R. T. Lewellen, and V. R. Stewart.

### North Dakota Agricultural Experiment Station

Fargo, Minot, and Williston: K. L. Lebsock\*, Charles Hill,  
E. French, Al Schneider, C. Swallers, and G. N. Geisler.

### South Dakota Agricultural Experiment Station

Brookings, Centerville, Eureka, Highmore, and Watertown:  
D. G. Wells, Q. Kingsley, G. Bucheneau, J. J. Bonneman,  
F. S. Holmes, and A. Dittman.

### Oregon State University

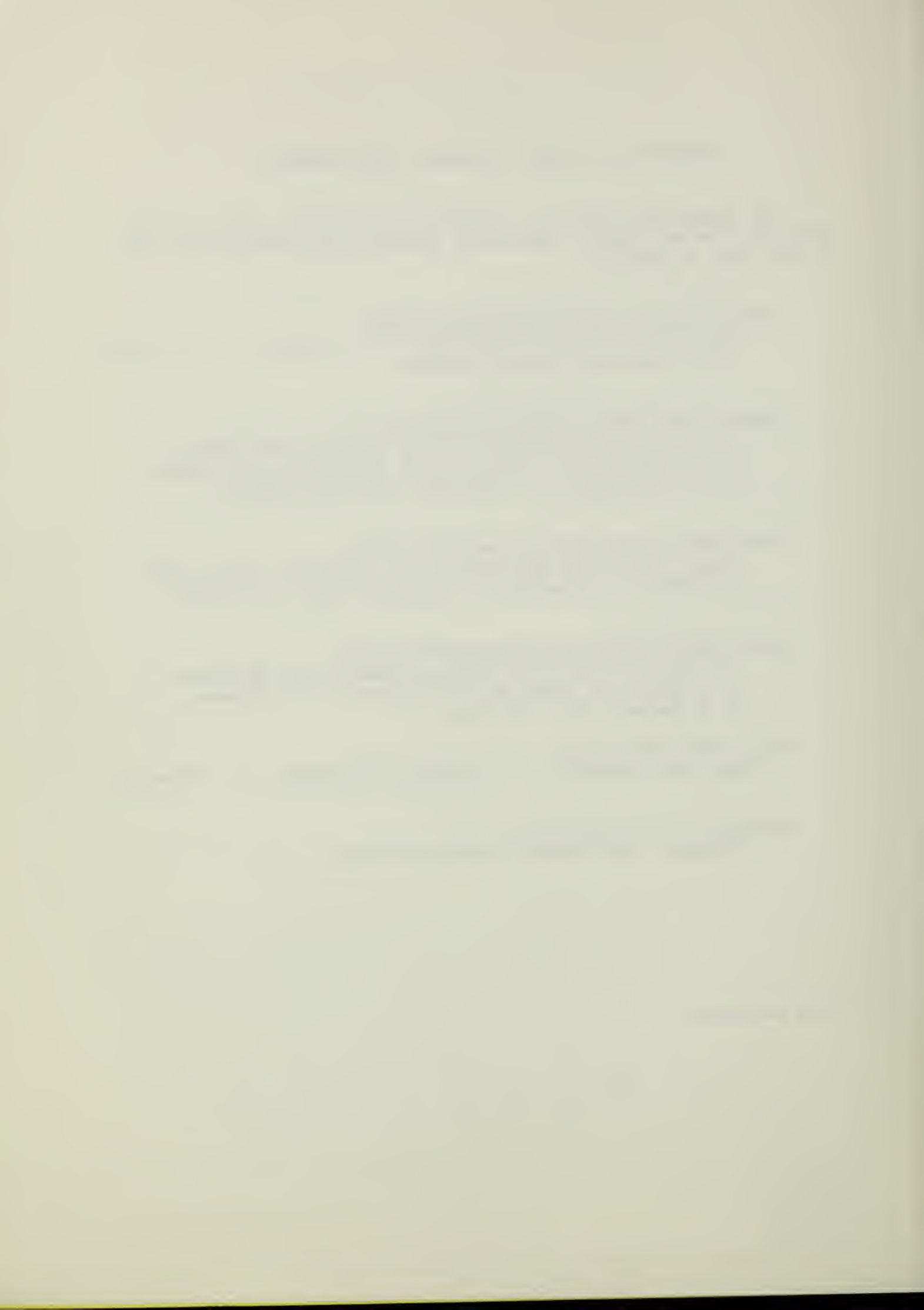
Moro and Pendleton: W. H. Foote, C. R. Rohde, J. T. McDermid.

### Washington State University

Pullman: John Dickey and Lawrence Bacon.

\* ARS Employees.







## INTRODUCTION

This, the fifth annual Durum Wheat Quality Report, is for the 1966 crop. Samples of standard varieties and new strains of durum wheat grown in cooperative experiments in the durum wheat region of the United States<sup>3/</sup> were milled and evaluated by the Hard Red Spring and Durum Wheat Quality Laboratory in cooperation with the Cereal Technology Department on the campus of North Dakota State University at Fargo, North Dakota. The evaluation of the field plot and some advanced durum wheats is integrated with the work done by the Cereal Technology Department of North Dakota State University. Methods and techniques are described in detail in the text of the report.

Where sufficient quantity of sample was available, the semolina was processed into macaroni to determine the quality characteristics. Other tests performed were dependent upon the quantity of semolina or durum wheat. When sufficient quantity of durum wheat was available for making macro macaroni, several strands of macaroni were produced from the sample. When the quantity was insufficient, only the slick test and mixograph or farinograph was employed.

The purpose of this report is to make available to cooperators the quality data on standard varieties and new strains of durum wheat from the 1966 crop.

The relatively new milling and slick test adopted in this report is more fully described under the Milling, the Color Score, and Dry Slick Color Score in the Methods Section. A statistical study of results, comparing the dry slick method and other established evaluation methods was given in the section of Statistical Study of the Dry Slick Color Score in the 1963 report (CR-59-64).

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<sup>3/</sup> Lebsock, K. L., "Results on Spring Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1966." U.S. Department of Agriculture, ARS, Crops Research Division, CR-5-67.



## SOURCE OF THE SAMPLES

Four hundred and eighteen samples were received from 19 stations in six states--Minnesota, Montana, North Dakota, Oregon, South Dakota, and Washington for durum wheat quality tests. Approximately 25% of the samples tested were of the named commercial varieties of Lakota, Langdon, Leeds, Mindum, Sentry, Stewart 63, and Wells. The remaining samples were either new varieties or samples received from a special test for quality evaluation.

Six samples were from field plots grown in North Dakota.

One hundred samples were Uniform Nursery samples grown in Minnesota and South Dakota. No samples were received from North Dakota or Montana.

One hundred and ninety Preliminary Nursery samples were grown at Fargo, North Dakota and Pullman, Washington.

Twenty-four Advanced Yield Nursery samples were received from Bozeman, Creston, Havre, Huntley, Moccasin, and Sidney, Montana raised on irrigated and dry land.

Twenty-two samples were received from Moro and Pendleton, Oregon.

Twenty-eight Advanced Nursery samples were received from five South Dakota stations.

Twenty-four International Durum Yield Nursery samples were received from the Brookings, South Dakota station.

Twenty-four International Durum Yield Nursery samples were received from the Minot, North Dakota station.

On page 5, are listed the durum wheats which were included in the Uniform Regional Nursery 1966 trials. The variety or cross, the station which developed the variety, the state selection number and the C.I. number are given.



1966 UNIFORM REGIONAL DURUM ROD-ROW NURSERY

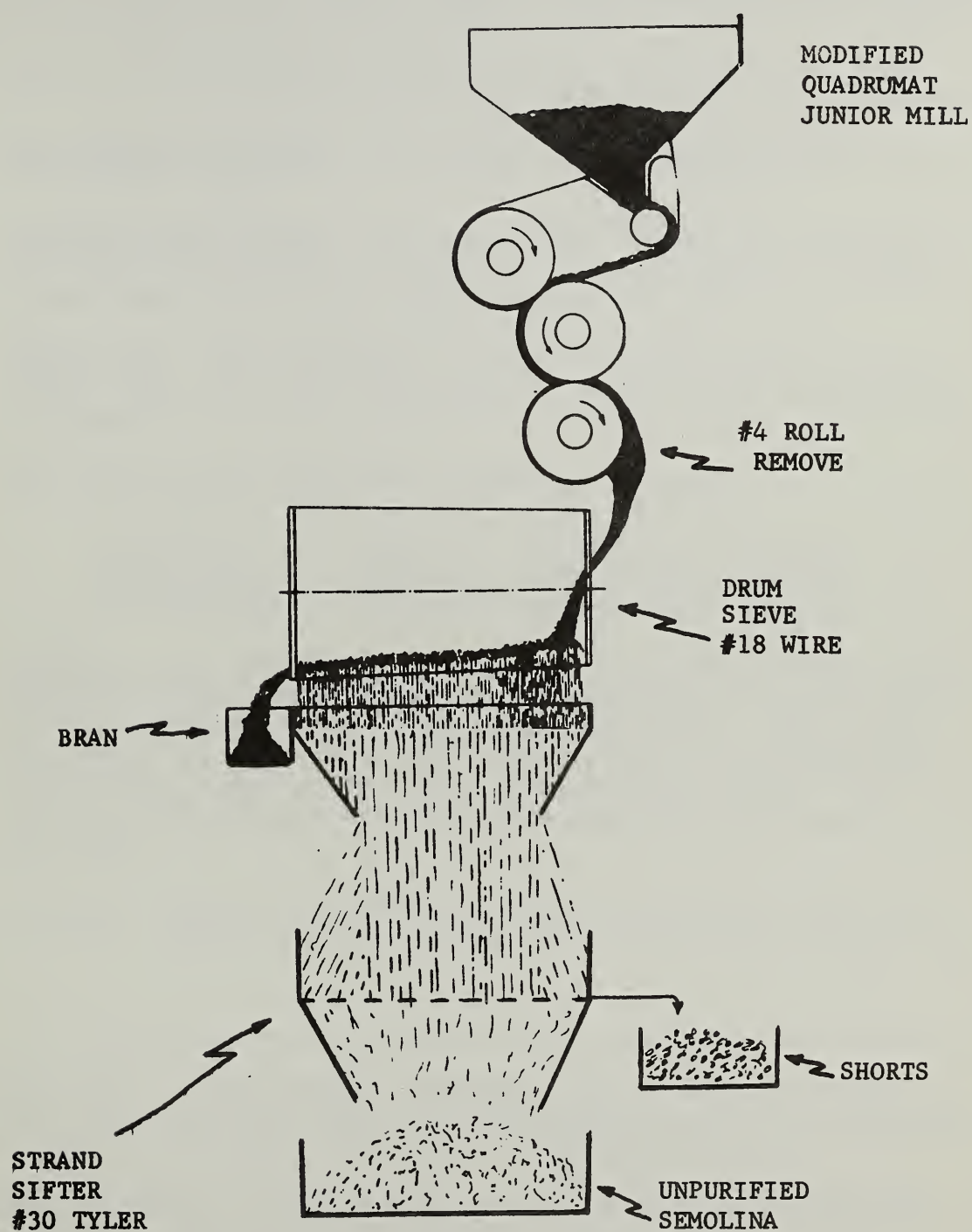
Entry No.	Cross or Variety	Sel. No.	C.I. No.	Developing Station
1	Mindum		5296	Minnesota
2	Wells		13333	North Dakota
3	Lakota		13335	" "
4	Stewart 63		13771	Canada
5	Leeds	60-115	13768	North Dakota
6	Br 180 - Wells	61-48	13942	" "
7	Ld 393 - Stewart	61-82	-	" "
8	Lakota - Langdon	62-29	-	" "
9	56-3 <sup>1</sup> / <sub>2</sub> x 56-112	62-73	-	" "
10	Lakota <sup>2</sup> x Langdon	62-212	-	" "
11	56-1 <sup>1</sup> / <sub>2</sub> x Langdon	63-1	-	" "
12	do	63-2	-	" "
13	do	63-3	-	" "
14	Sentry x 56-17 <sup>1</sup> / <sub>2</sub>	63-32	-	" "
15	Sentry x 56-45	63-33	-	" "
16	Lakota x St 464 - Langdon	63-48	-	" "
17	56-1 <sup>1</sup> / <sub>2</sub> x Ld 408	63-51	-	" "
18	RL 3097-RL 3304 x Sr - Ld 393	DT 184	-	Canada
19	do	DT 188	-	"
20	do	DT 191	-	"

<sup>1</sup>/<sub>2</sub> 56-1, 56-3, and 56-17 are Ld 357<sup>4</sup> x (Sr x PI 192179 - Ld 357)





## FLOW DIAGRAM FOR SMALL DURUM WHEAT SAMPLES







## METHODS

The methods used in the testing of the samples were essentially the same as given in last year's report, with the addition of some new tests and interpretations of the tests.

Briefly, the following methods and terminologies were applied:

Test Weight Per Bushel - The weight per Winchester bushel of dockage-free wheat.

Thousand Kernel Weight - The 1000 kernel weight was determined by counting the number of kernels in a 10 g. sample of cleaned, picked wheat with an Asco Seed Counter<sup>4/</sup>.

Kernel Size - The percentage of the size of the kernels (large, medium, and small) was determined on a wheat sizer as described by Shuey<sup>5/</sup>.

The sieves of the sizer were clothed as follows:

Top Sieve	-	Tyler # 7	with 2.92 mm. opening
Middle Sieve	-	Tyler # 9	with 2.24 mm. opening
Bottom Sieve	-	Tyler #12	with 1.65 mm. opening

Milling - The field plot and large advanced yield nursery samples were milled and tested in cooperation with the Department of Cereal Technology, North Dakota State University. The dockage-free wheat was tempered in two stages, first to 13.5% moisture for 18 hours, then to 15-1/2% one hour before milling. The method is essentially the same as described by Harris and Sibbitt<sup>6/</sup>.

The other samples were milled on a modified Brabender Quadrumat Jr. Mill. The #4 roll was replaced by a wooden blank plug. The

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<sup>4/</sup> Mention of a trade product, equipment, or a commercial company in this publication does not imply its endorsement by the U.S. Department of Agriculture over similar products of companies not named.

<sup>5/</sup> Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5: 71-72,75 (1960).

<sup>6/</sup> Harris, R. H., and Sibbitt, L. D. Experimental Durum Milling and Processing Equipment with Further Quality Studies on North Dakota Durum Wheats. Cereal Chemistry 19: 388-402 (1942).



drum sieve was clothed with #18 wire. The thoroughs of the #18 wire were sifted on a Strand Sifter equipped with a #30 Tyler sieve. The sample was tempered to 12.5% and allowed to stand for at least 72 hours. After the sample was properly tempered for the required length of time to 12.5% moisture, the sample was again tempered to 13.5% and allowed to stand overnight. An additional 2.5% moisture was added to the sample one-half to three-fourths hour before milling. The sample was sifted on the Tyler wire for one minute. The thoroughs of the #30 wire were classified as unpurified semolina. This material was used in testing the quality of the semolina.

Protein Content - The protein was calculated by multiplying by the factor of 5.7, the percent nitrogen, as determined by the standard Kjeldahl procedure.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 600° C. The results were reported as percentage of the sample which was incinerated.

Absorption - This was the water, expressed as percent of the semolina required to bring the dough to the proper consistency.

All values (protein, ash, absorption) are reported on a 14% moisture basis.

Color Score - The color of the macaroni or semolina has been generally accepted as the most important single grading factor. A deep amber or golden color is the most preferable. The amount of yellow pigmentation determined the extent or degree of amber-ness.

Samples which have a color rating below 8 for macaroni and 80 for slick color are unsatisfactory. It is possible that the average color score for a crop year may be higher or lower than average, therefore, this would be taken into consideration when giving the over-all rating of a variety for that given year. A sample may receive a low rating for reasons other than a deficiency of yellow pigmentation such as: Dullness - D; Grayness - G; Redness - R; Branny - B; Chalkiness or White Cast - W, and Speckiness - S, or a combination of these factors. The sample will be rated accordingly with the exception of the intensity, quantity and depth of the yellow pigmentation.

The following grading system has been adopted for scoring the color of macaroni and semolina:



COLOR SCORE

<u>Macaroni</u>	<u>Dry Slick</u>	<u>Description</u>
12	105	Much deeper and intense yellow pigmentation than standard.
11	100	Deeper and more intense yellow pigmentation than standard.
10	90	Standard quality, depth and intensity of yellow pigmentation.
9	85	Slightly less depth and intensity, but sufficient quantity of pigmentation.
8	80	Slightly less quantity as well as depth and intensity of pigmentation than the standard, but still sufficient to be rated satisfactory on the basis of color.
7	70	Sufficiently less quantity of yellow pigmentation than the standard to give a pale yellow color and graded unsatisfactory for color score.
6	60	Sufficiently less quantity of yellow pigmentation than the standard to give a very pale yellow color.
5	50	Only a sufficient quantity of yellow pigmentation to indicate an off-white color with a yellow hue.

The numerical rating describes the depth or amount of pigmentation.

In cases where a sample is graded down because of off-color, speckiness, etc., the designation is shown by a letter abbreviation following the numerical score. For example: 4 W would indicate the sample was chalky white with little or no yellow pigmentation; 6 D would indicate that the sample had some yellow pigmentation, but was dull.

Dry Slick Color Score - This is determined by slicking the sample with a standard of known color rating and comparing the two.







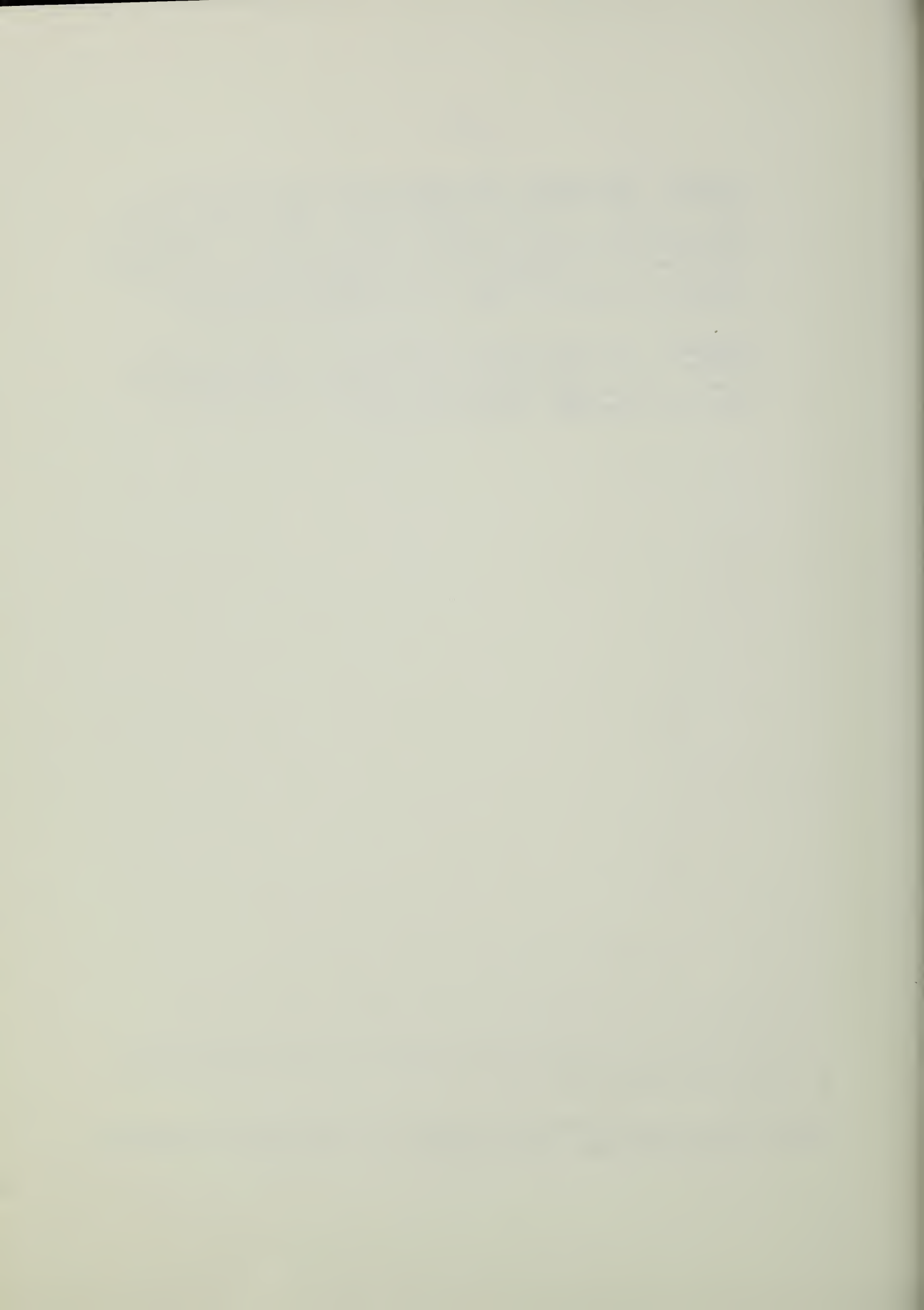
Mixogram - Farinogram - The mixograph has been used when the sample was too small for the farinograph. With either instrument is yielded a graphic record of the progressive changes in dough characteristics, during the mixing process. A descriptive term relative to strength has been used to describe the curve rather than numerical values. The reference mixogram and farinogram patterns are shown at the end of the report.

Macaroni - Six hundred grams of semolina are mixed with water to form a stiff dough which is then pressed into macaroni and dried. The equipment and procedure have been described by Harris and Sibbitt<sup>6/</sup>, and by Fifield<sup>7/</sup>.

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<sup>6/</sup> Harris and Sibbitt, loc. cit.

<sup>7/</sup> Fifield, C. C. Experimental Equipment for Manufacture of Alimentary Pastes. Cereal Chem. 11: 330-334 (1934).



## EXPERIMENTAL RESULTS

The results obtained for the 1966 crop of durum wheat samples are tabulated and presented in the following order: Table 1 - Field Plot Experiments; Tables 2 and 3 - Preliminary Yield Nursery Samples from Fargo, North Dakota and Pullman, Washington; Tables 4 through 6 - Uniform Regional Nursery Samples; Tables 8 and 9 - Advanced Yield Nursery Samples, and Tables 10 and 11 - International Durum Yield Nursery Samples from Brookings, South Dakota and Minot, North Dakota. Averages are presented wherever such values appeared to be useful. None of the samples tested exhibited sprout, although some samples did exhibit severe weathering and blackpoint.

### DURUM FIELD PLOTS

North Dakota - (Table 1). Only 6 field plot samples were received from one station, Williston, North Dakota. The varieties, Lakota, Leeds, Mindum, Stewart 63, and Wells were received, as well as selection ND 62-73, which has good 1000 kernel weight, kernel size distribution, semolina yield, and macaroni color score. There was no major fault with this sample. The selection does show some promise.

### FARGO, NORTH DAKOTA PRELIMINARY YIELD NURSERY SAMPLES

(Table 2). The results for 156 samples received from the Fargo, North Dakota station are given in Table 2. Ten of the samples were the check varieties, Leeds and Wells, while the remaining 146 samples were new selections. The table is divided into two sections, 2a and 2b, because of the source of the seed. Table 2a contains the 119 samples whose source was the Durum Single-Row Trials. Table 2b contains those samples (37) whose source was the Mexican Single-Row Trials.

Approximately 2/3 of the samples were rated as showing little or no promise. The major faults were color, semolina extraction, and kernel size. Many of the Mexican origin samples gave very short and weak mixograms.

The 15 selections showing good promise in Table 2a were Nos. 653, 654, 6512, 6514, 6515, 6516, 6517, 6528, 6551, 6552, 6553, 6564, 6589, 65137, and 65140.



The 24 selections showing some promise in Table 2a were Nos. 651, 6518, 6519, 6520, 6521, 6524, 6536, 6543, 6554, 6556, 6557, 6559, 6560, 6562, 6565, 6567, 6584, 6585, 6591, 6592, 64116, 65118, 65119, and 65142.

From Table 2b, the 9 selections showing good promise were Nos. 6537, 6571, 6579, 65100, 65108, 65114, 65122, 65134, and 65580. Three selections in Table 2b showed some promise - Nos. 6572, 65112, and 65120.

#### PULLMAN, WASHINGTON PRELIMINARY YIELD NURSERY SAMPLES

(Table 3). Thirty-four samples were received from this nursery. Four of the samples were the named varieties, Lakota, Penjam 62, Sentry, and Wells. Approximately 1/6 of the selections showed no promise, primarily due to low semolina yield, poor color, and kernel size. This series of samples yielded unpurified semolina considerably less specky than any which were tested this year.

An equal number of selections (approximately 1/3 for each) showed good and some promise. The 12 selections showing good promise were Nos. X630012, X630020, X6301155, X6301309, X6301322, X6301404, X6301431, X6301473, X6301619, X6301735, X6301790, and X6401361. The 12 selections showing some promise were Nos. D640047, X6200755, X630010, X630016, X630017, X630033, X630036, X6301018, X6301364, X6401424, X6301620, and X6401401.

#### UNIFORM REGIONAL NURSERY SAMPLES

Twenty Uniform Regional Nursery samples were received from each of the three stations in Minnesota and two stations in South Dakota. These samples were processed using the modified Quadrumat Milling Flow (page 6), and rated for color using the dry slick test.

Minnesota - (Table 4). The data given in Table 4 are for the 60 samples received from the three Minnesota stations, Crookston, Morris, and St. Paul. The Crookston samples had good test weight, 1000 kernel weight, kernel size distribution and gave the highest percent extraction of semolina but poorer color. The St. Paul samples had the poorest test weight, 1000 kernel weight, kernel size distribution and the lowest extraction of semolina but the best color. The Morris samples were intermediate. The state averages are given in Table 6.

South Dakota - (Table 5). The data for the two stations from South Dakota, Highmore and Watertown, are given in Table 5. The samples from Watertown had higher 1000 kernel weights and larger





kernel size on an average than those from Highmore. Also, the Watertown samples yielded more semolina. The state averages are given in Table 6.

State Averages - (Table 6). The state averages for the Durum Uniform Regional Nursery samples from Minnesota and South Dakota are given in Table 6. The Minnesota samples had higher test weight, 1000 kernel weight, kernel size, percent extraction of semolina, and better color than the South Dakota samples, but lower protein. The 1966 crop had slightly better test weight, 1000 kernel weight, and smaller kernel size than the 1965 crop but higher yield of semolina. However, the color of the 1965 crop was better than the 1966 crop.

Selections 61-48, 62-73, 63-1, DT 188, and DT 191 show no promise, primarily due to poor color. These selections show the poorest over-all general evaluation.

Selection 63-33 shows good promise and had the best over-all rating.

The somewhat erratic results of selections 62-29 and 63-32 should give them an over-all evaluation of little promise.

All the other selections show some promise.

#### OREGON UNIFORM REGIONAL NURSERY SAMPLES

(Table 7). Eleven Oregon Uniform Regional Nursery samples were received from each of two stations, Moro and Pendleton, Oregon. Five of the samples were the named varieties, Lakota, Langdon, Leeds, Stewart 63, and Wells. The other 6 samples were selections 58-312, 58-321, 61-82, 62-73, 63-1, and 63-51. On an average, the Pendleton samples were ranked higher than the Moro due to better color. The Moro samples yielded a higher percentage of unpurified semolina which may be a reflection of the lower protein content and "starch-like" kernels.

The selection 58-321 shows no promise, consistently giving poor color. The selections 58-312 and 62-73 show little promise having only minimum acceptable color for the Pendleton samples. The selections 61-82 and 63-1 show some promise. Selection 63-51 gave the best results and this selection shows good promise.

#### SOUTH DAKOTA ADVANCED YIELD NURSERY SAMPLES

(Table 8). Twenty-eight samples were received from five stations in South Dakota - Brookings, Centerville, Eureka, Highmore, and Watertown, comprised of the named varieties, Lakota, Leeds, Stewart 63,





and Wells. Two sets of each series were raised at Brookings and Watertown. The compiled average results for each variety are given for comparative purposes. The Brookings "BK Series" had the highest test weight, semolina yield, and largest kernel size distribution, as well as the lowest protein. The Brookings "B Series" gave the highest color score. The Highmore series gave the lowest test weight, 1000 kernel weight, and semolina yield, as well as the smallest kernel size distribution. None of the Stewart 63 samples gave acceptable color.

#### MONTANA ADVANCED YIELD NURSERY SAMPLES

(Table 9). Twenty-four Advanced Yield Nursery samples were received from six Montana stations - Bozeman, Creston, Havre, Huntley, Moccasin, and Sidney. The samples were comprised of three named varieties, Lakota, Leeds, and Wells. The samples were raised on both irrigated and dryland at Huntley and Sidney and on irrigated land at Bozeman. Comparison of the nine samples raised on dryland and irrigated show the dryland sample to average 0.5 points higher in macaroni color. The dryland samples had poorer test weight, 1000 kernel weight, and kernel size distribution, but higher protein than the irrigated samples.

#### INTERNATIONAL DURUM YIELD NURSERY SAMPLES

Forty-eight International Durum Yield Nursery samples were received--24 each from Brookings, South Dakota and Minot, North Dakota stations. The Brookings series did not have Selkirk but did have Entry No. M66-18, while the Minot series did not have Entry No. M66-18, but did have Selkirk. Entry Nos. M66-8, M66-16, M66-22, and Ld390 are the most promising of the series.

(Table 10). Twenty-four samples were received from the Brookings, South Dakota station of the international durum yield nursery. Five of the samples were named varieties, Langdon, Lerma Rojo 64, Oviachik, Penjamo 62, and Tehuacan 60. Of this named variety series, only the Langdon sample had sufficient color to be acceptable. Entry Nos. M66-7, M66-8, and M66-16 showed little promise, and Entry No. M66-22 and Ld390 showed some promise. All of the other samples gave poor color and show no promise.

(Table 11). Twenty-four samples were received from the Minot, North Dakota station of the international durum yield nursery. Six of the samples were the named varieties, Langdon, Lerma Rojo 64, Oviachik, Penjamo 62, Selkirk, and Tehuacan 60. Of this named variety series, only the Langdon sample had sufficient color to be

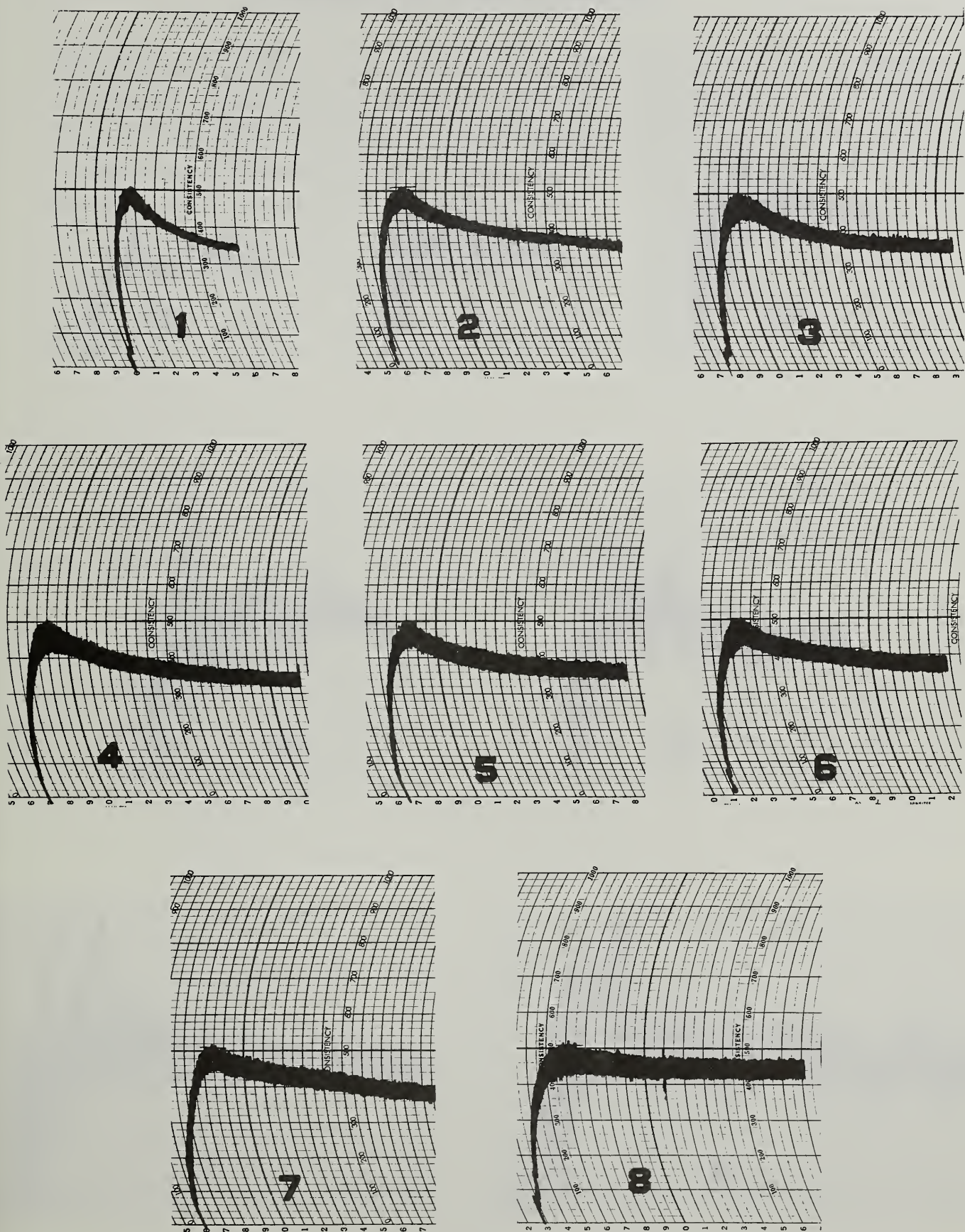


acceptable. Entry Nos. M66-8 and M66-16 of this series show some promise and Entry No. M66-22, shows good promise. The selection Ld390 shows some promise. All of the other samples gave poor color and show no promise.





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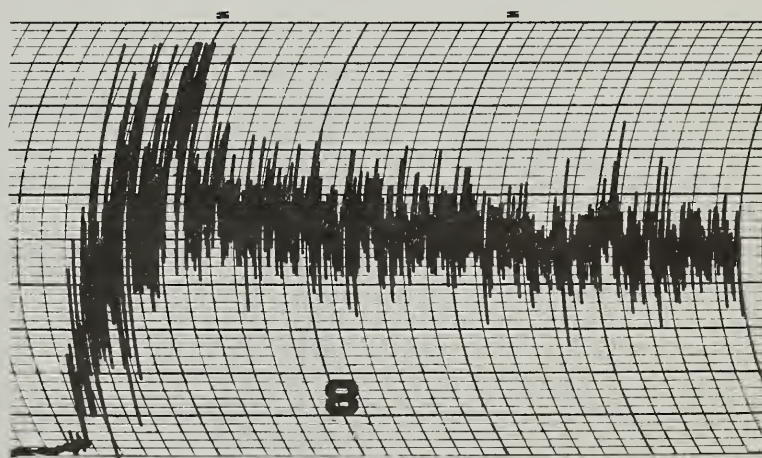
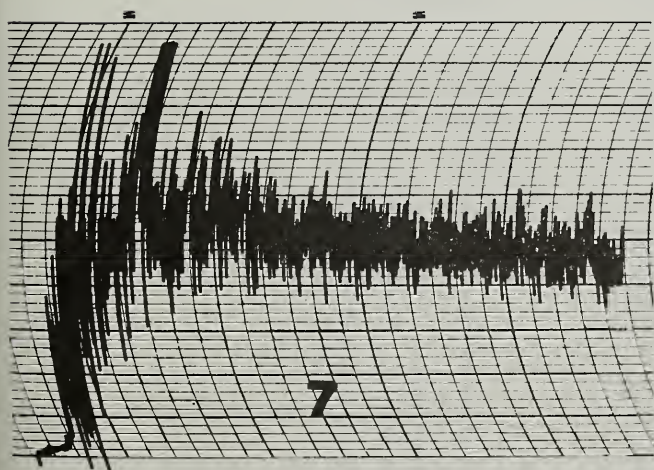
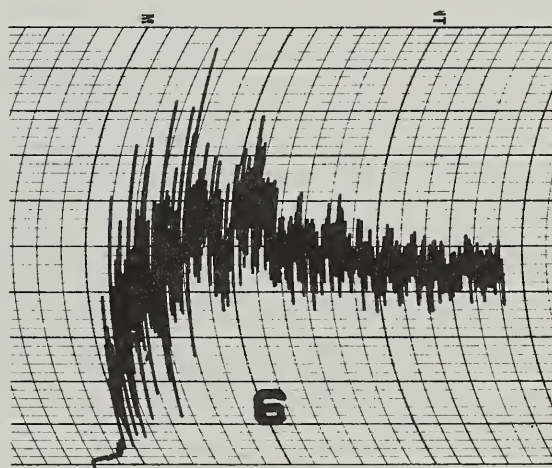
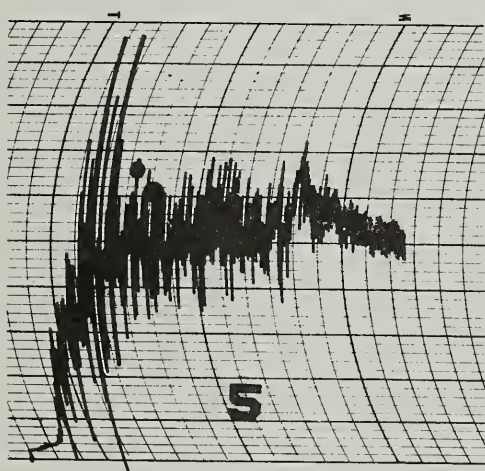
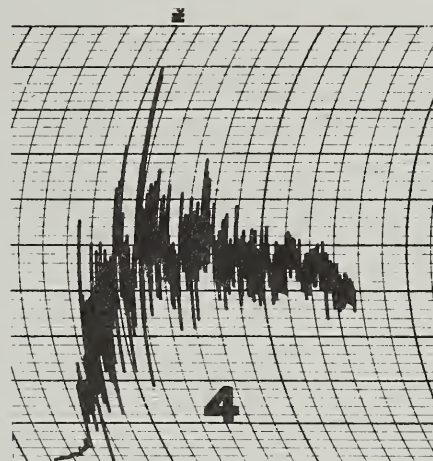
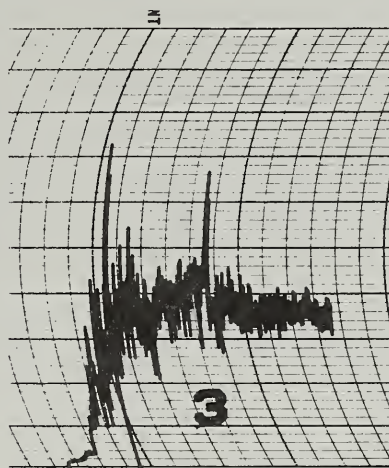
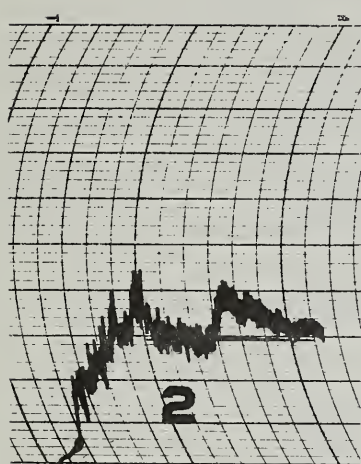


REFERENCE FARINOGRAMS  
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REFERENCE MIXOGRAMS  
DURUM WHEAT



TABLE 1

## QUALITY DATA ON DURUM FIELD PLOT NURSERY SAMPLES

1966 CROP

Variety or State Sel. No.	C. I. No.	T. W. 1/ #/Bu.	1000 Kwt.	Wht. Pro. 2/ %	Kernel Size			Sem. Pro. 2/ %	Pur. Sem. 3/ %	Ash 2/ %	Specks/ 10 Sq. In.	Sem. Abs. 2/ %	Vis. Color 4/ %	Farino. Rate 5/ %	Farino. Abs. 2/ %
					Lg.	Med.	Sm.								
			g.	%	%	%	%	%	%	%					
Williston, North Dakota															
Lakota	13335	60.1	27.9	16.5	5	84	11	15.5	56.8	.79	7	35.0	11.0	7	30.0
Leeds	13768	62.2	34.4	16.1	12	82	6	15.3	61.1	.81	23	33.3	10.5	2	28.2
Mindum	5296	61.0	33.0	16.8	13	80	7	15.7	58.2	.80	7	33.7	9.0	5	29.1
Stewart 63	13771	60.7	35.7	16.7	9	86	5	15.8	60.5	.83	13	34.0	9.0	5	29.7
Wells	13333	61.2	30.0	15.9	7	86	7	14.9	58.0	.89	7	33.3	10.5	4	29.0
ND 62-73		62.3	33.3	15.8	10	85	5	14.6	58.6	.81	10	34.7	9.5	6	29.3

1/ Unofficial

2/ 14% Moisture Basis

3/ Purified

4/ Below 8 color score not acceptable.

5/ Refer to Reference Farinograms.

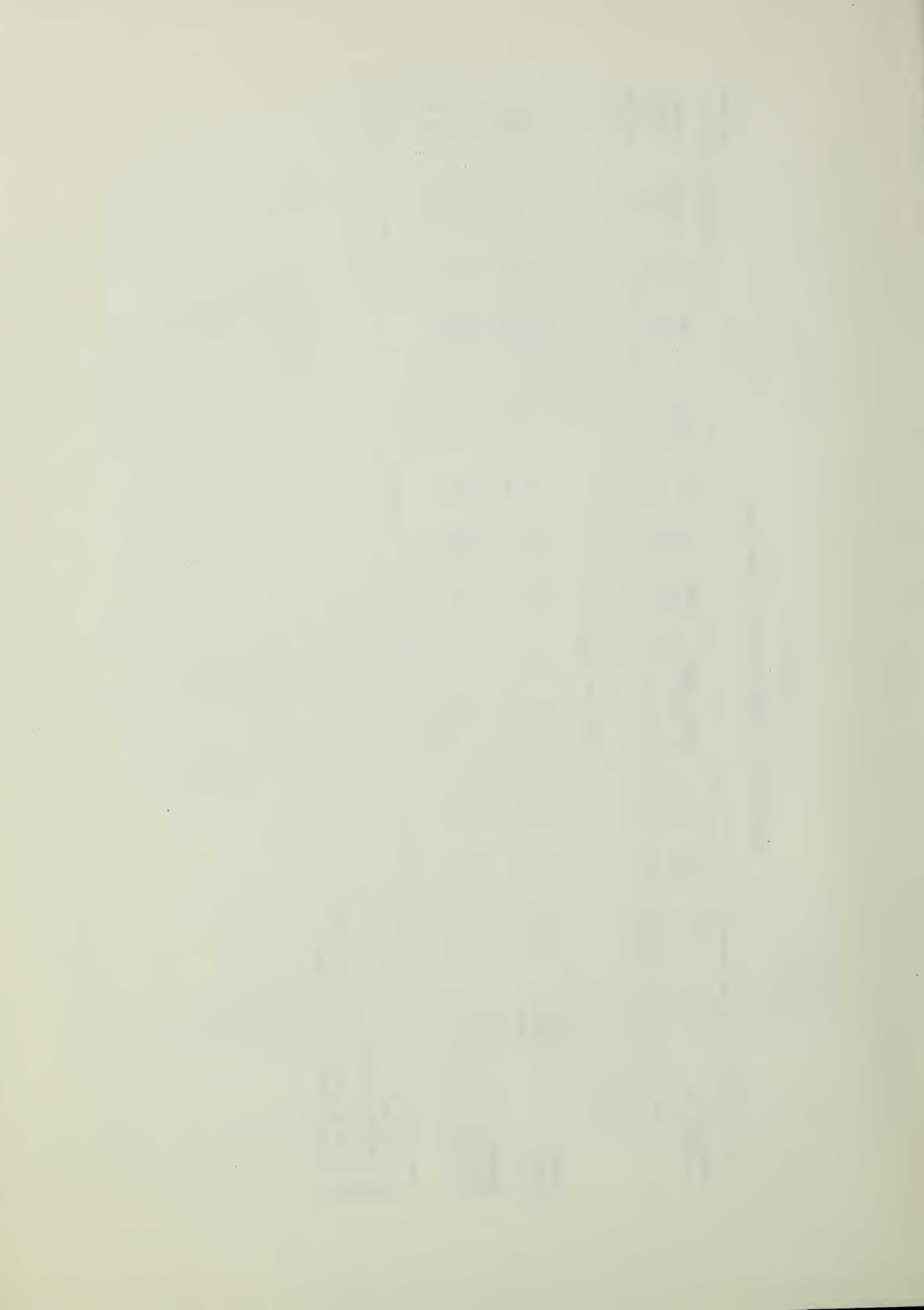




TABLE 2a

## QUALITY DATA ON DURUM WHEAT PRELIMINARY SINGLE-ROW YIELD NURSERY SAMPLES

Durum Single-Row

Fargo, North Dakota

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000 Kwt.	Wht. Pro.	Kernel Size			Semolina	Color Score	Mixogram	Gen. Eval.
		<u>1/</u>			Lg.	Med.	Sm.				
		<u>1/</u>		<u>2/</u>				<u>3/</u>	<u>4/</u>	<u>5/</u>	<u>6/</u>
		#/Bu.	g.	%	%	%	%	%			
Wells	13333	62.0	28.0	14.1	1	91	8	48.5	84	4	
651		62.0	31.0	14.1	5	90	5	47.0	83	5	3
653		60.0	30.8	14.3	10	87	3	47.0	86	4	4
654		61.0	33.2	14.1	11	86	3	46.9	87	4	4
Lk x Wisc-Tehuacan		59.0	24.4	14.3	0	89	11	43.3	85	4	2
Leeds	13768	63.5	31.5	14.2	3	94	3	46.9	90	3	
657		61.5	29.8	14.1	1	93	6	46.7	65	4	1
658		61.5	31.6	14.1	3	92	5	46.0	65	4	1
659		61.5	29.8	14.3	3	94	3	47.2	70	5	1
6510		62.0	31.7	14.2	9	90	1	44.8	75 R	5	1
6511		62.0	34.0	13.8	17	80	3	45.7	65	4	1
6512		63.0	32.5	13.7	6	89	5	47.5	82	4	4
6513		59.5	27.5	14.0	0	89	11	43.8	85	5	2
6514		61.5	35.1	15.2	39	60	1	43.2	90	5	4
6515		62.5	34.6	14.0	9	89	2	47.9	85	4	4
6516		63.5	35.2	13.9	11	87	2	48.5	86	4	4
6517		63.5	31.6	13.9	8	89	3	48.2	85	4	4
6518		59.0	38.2	14.6	14	84	2	38.0	84	5	3
6519		60.0	39.4	13.4	35	62	3	43.2	95	6	3
6520		58.5	45.2	13.9	35	63	2	42.2	88	7	3
6521		57.5	45.8	15.6	63	36	1	41.1	91	7	3
6522		58.5	35.1	14.5	5	92	3	43.2	81	6	2
6523		56.5	29.2	15.7	2	90	8	42.3	85	6	2
6524		58.5	39.2	15.3	19	80	1	41.4	88	5	3
6525		58.5	32.5	14.4	31	67	2	46.7	79	6	1
6526		61.0	41.0	14.0	33	65	2	46.0	81	6	2
6527		54.0	39.5	15.0	11	85	4	46.6	84	6	2
6528		59.0	32.9	14.7	38	60	2	45.3	96	4	4
6529		60.0	38.2	15.0	44	55	1	45.4	79	6	1
6530		60.5	37.6	14.6	19	79	2	44.4	88	8	2
Wells	13333	62.0	27.9	13.6	1	92	7	45.4	85	3	
6531		60.5	35.6	15.2	15	82	3	42.9	90	8	2
6532		60.5	25.5	14.8	1	86	13	40.6	83	4	1
6533		61.0	26.6	14.7	1	90	9	43.2	83	2	1
Leeds	13768	64.5	33.6	13.8	5	92	3	46.6	86	3	
6534		63.0	25.8	13.6	0	91	9	43.2	85	5	1
6535		62.5	30.0	13.9	1	94	5	42.0	84	5	2
6541		62.0	32.3	13.8	5	92	3	42.3	65	5	1
6542		63.5	31.7	13.6	2	93	5	43.6	85	3	2
6543		62.5	29.2	14.0	3	92	5	43.6	92	3	3

(CONT'D.)





TABLE 2a (Cont'd.)

## QUALITY DATA ON DURUM WHEAT PRELIMINARY SINGLE-ROW YIELD NURSERY SAMPLES

Durum Single-Row

Fargo, North Dakota

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.		Score		Eval.
		<u>1/</u>		<u>2/</u>				<u>3/</u>	<u>4/</u>	<u>5/</u>	<u>6/</u>
		#/Bu.	g.	%	%	%	%	%			
6544		63.0	34.4	13.8	11	87	2	44.2	79	3	1
6545		63.0	31.1	14.2	1	93	6	43.9	78	4	1
6546		62.0	30.3	14.2	3	92	5	43.6	79	4	1
6547		63.0	31.3	14.4	5	91	4	43.2	81	6	1
6548		63.0	31.9	14.8	4	91	5	42.0	75	6	1
6549		63.0	34.0	14.4	3	94	3	42.9	81	6	1
6550		63.5	33.8	14.4	6	91	3	42.0	79	6	1
6581		62.0	32.4	14.2	5	92	3	41.7	75	4	1
6582		63.0	33.3	14.2	4	92	4	42.9	82	4	2
6583		63.0	31.1	14.1	3	93	4	43.9	84	5	2
6584		63.5	33.3	14.1	4	93	3	44.2	82	3	3
6585		63.0	30.8	14.5	2	95	3	44.4	85	5	3
6586		62.0	30.7	14.7	3	91	6	43.8	85	6	2
6587		60.5	29.9	14.0	1	92	7	42.7	84	5	2
6588		61.0	28.2	14.0	1	93	6	45.1	84	5	2
6589		62.5	31.7	14.3	4	93	3	46.0	85	3	4
6590		63.5	30.7	14.3	1	96	3	45.4	85	2	2
Wellis	13333	61.5	25.3	14.4	1	90	9	46.6	84	2	
6591		61.5	29.6	15.1	1	93	6	46.0	84	4	3
6592		61.5	29.6	14.5	3	92	5	46.3	82	3	3
6593		61.5	31.5	13.2	4	93	3	46.0	78	2	1
6594		63.0	35.6	13.0	10	88	2	45.7	79	3	2
Leeds	13768	64.0	31.2	15.7	3	94	3	46.3	86	2	
65132		58.0	27.1	14.3	2	90	8	41.7	83	5	1
65133		58.5	26.6	15.3	1	90	9	42.6	84	5	2
65134		61.5	28.2	13.4	1	92	7	44.2	82	4	2
65135		60.5	31.1	14.7	11	84	5	46.3	85	2	2
65136		59.0	27.5	14.4	2	90	8	45.7	79 R	3	1
65137		59.0	29.9	14.2	8	85	7	45.4	86	4	4
65138		59.5	27.5	13.8	1	90	9	43.6	82	4	2
65139		60.5	27.4	15.5	1	91	8	46.6	83	3	2
65140		62.5	31.9	13.8	7	90	3	46.3	83	3	4
65141		62.0	29.3	13.9	3	90	7	45.4	81	2	2
65142		62.0	31.6	14.2	7	88	5	46.3	81	3	3
65143		60.5	24.6	14.1	0	86	14	44.7	82	4	1
65144		61.0	25.3	13.6	1	89	10	45.4	82	3	1
65145		62.0	27.5	13.5	2	90	8	45.7	82	3	2
65146		56.5	21.8	16.3	0	77	23	40.5	78 R	4	1
65147		61.5	23.8	14.6	0	83	17	40.7	81	5	1
652		62.0	27.9	13.6	1	91	8	44.2	80	5	1

(CONT'D.)



TABLE 2a (Cont'd.)

## QUALITY DATA ON DURUM WHEAT PRELIMINARY SINGLE-ROW YIELD NURSERY SAMPLES

Durum Single-Row

Fargo, North Dakota

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.	<u>3/</u>	Score	<u>5/</u>	Eval.
		#/Bu.	g.	%	%	%	%		<u>4/</u>		<u>6/</u>
655		61.0	33.2	13.4	6	90	4	41.7	75 R	4	1
6536		62.0	27.7	14.0	3	91	6	45.7	86	4	3
6551		63.0	34.6	14.2	15	82	3	46.3	85	3	4
6552		63.0	29.2	13.9	3	91	6	48.5	85	5	4
6553		62.0	36.0	14.3	56	41	3	46.6	81	4	4
6554		63.0	37.9	14.9	28	71	1	46.6	80	5	3
6555		63.0	35.2	14.6	17	81	2	46.9	75	4	1
6556		62.5	33.4	13.7	5	92	3	48.5	81	2	3
6557		60.0	29.4	13.8	2	90	8	46.0	85	3	3
6558		61.5	28.1	14.2	1	92	7	46.0	81	5	2
6559		61.0	30.5	14.2	2	95	3	44.8	88	5	3
6560		62.5	31.4	13.7	3	94	3	46.3	81	5	3
6561		61.5	32.5	13.5	10	87	3	44.4	80	5	2
6562		63.0	29.2	13.7	2	91	7	46.3	88	5	3
6563		60.5	32.2	14.9	9	88	3	44.4	77	2	1
6564		62.5	33.3	14.7	9	88	3	45.7	86	4	4
6565		63.0	34.6	13.3	9	87	4	44.8	84	4	3
6566		63.0	34.7	13.5	9	88	3	45.1	75	4	1
6567		63.0	34.5	13.3	9	87	4	45.1	81	4	3
6568		60.5	32.5	13.9	7	85	8	42.9	81	4	2
6569		60.0	30.8	13.5	4	89	7	42.9	81	4	2
6570		59.5	30.2	13.3	3	88	9	43.5	81	5	2
Wells	13333	61.5	31.7	13.5	4	89	7	46.6	81	4	
65101		60.5	30.1	13.2	1	90	9	46.0	80	6	2
65103		58.5	28.7	13.9	5	87	7	44.1	80	6	2
65104		60.0	37.3	15.1	23	72	5	44.7	79	5	1
65105		59.5	34.7	15.1	13	80	7	43.2	75	5	1
65106		60.0	33.9	14.8	11	83	6	43.2	78	6	1
65107		60.5	32.6	13.2	3	89	8	47.8	77	4	1
65113		62.0	32.5	13.8	3	94	3	44.2	80	4	2
65115		62.0	30.9	14.3	3	92	5	41.7	82	4	2
65116		62.5	30.2	14.3	4	89	7	45.1	83	3	3
65117		60.5	27.9	15.2	0	91	9	42.3	81	4	2
65118		62.0	29.4	14.5	3	90	7	45.7	83	3	3
65119		62.0	28.0	13.8	0	93	7	46.9	83	4	3
Leeds	13768	63.0	32.1	14.3	4	92	4	45.7	85	2	
65126		62.5	28.2	12.1	0	93	7	44.5	79	4	1
65127		63.0	28.2	13.4	0	92	8	45.1	80	4	2
65128		60.0	25.4	13.0	0	85	15	42.6	75	4	1

1/ Unofficial2/ 14% Moisture Basis3/ Unpurified4/ Below 80 color score not acceptable. R - Red.5/ Refer to Reference Mixograms for numerical curve pattern.6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



TABLE 2b

## QUALITY DATA ON DURUM WHEAT PRELIMINARY SINGLE-ROW YIELD NURSERY SAMPLES

Mexican Single-Row

Fargo, North Dakota

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.		Score		Eval.
		<u>1/</u> #/Bu.	g.	<u>2/</u> %	%	%	%	<u>3/</u> %	<u>4/</u>	<u>5/</u>	<u>6/</u>
Leeds	13768	63.0	37.7	14.4	41	57	2	41.4	82	3	
6571		63.5	40.3	14.9	48	52	0	42.9	81	3	4
6595		63.0	35.2	14.1	31	66	3	40.7	79	4	2
6596		62.0	38.8	13.9	42	57	1	40.7	70	5	1
6597		63.0	38.6	11.9	40	59	1	42.7	75	4	1
6598		63.0	37.7	13.6	21	77	2	42.9	75	5	1
6599		63.0	39.8	12.7	47	52	1	43.9	78	5	2
65100		63.0	41.0	14.0	55	44	1	43.2	85	5	4
65102		62.0	37.5	14.3	30	67	3	44.2	78	4	1
65112		62.5	40.8	15.7	60	39	1	43.3	79	5	3
65125		61.5	37.3	14.2	50	49	1	42.3	79	5	2
65129		62.0	37.2	13.8	31	68	1	42.9	78	5	1
65130		62.0	34.4	12.5	21	76	3	43.6	78	5	1
65131		61.5	38.6	14.1	52	45	3	42.9	78	4	2
6572		64.0	34.8	14.0	29	70	1	44.5	88	3	3
6573		64.0	41.7	13.7	60	40	0	46.0	70	4	1
65109		63.0	33.8	13.5	32	66	2	43.8	77	4	1
65110		62.5	39.7	14.2	67	32	1	43.3	75	4	1
65111		62.5	35.6	13.3	41	57	2	44.2	70	3	1
65114		63.5	36.0	13.8	31	68	1	44.8	84	4	4
Wells	13333	64.5	36.0	13.5	47	50	3	43.2	79	4	
65120		64.0	37.0	13.7	46	52	2	44.2	81	2	3
65121		63.5	37.7	14.3	53	46	1	43.6	78	3	2
65122		64.0	36.8	14.5	46	53	1	45.7	81	4	4
6574		63.0	40.0	13.2	55	44	1	47.2	75	3	2
6575		63.5	42.4	15.1	63	36	1	47.2	78	2	1
6576		63.0	41.2	15.3	62	37	1	47.0	78	2	1
6577		62.5	43.7	16.2	66	33	1	43.9	75 R	5	1
6578		63.0	42.7	15.1	63	36	1	45.4	78	5	2
6579		62.0	36.4	13.6	30	67	3	45.1	83	4	4
65580		62.5	39.5	13.7	51	48	1	46.3	81	4	4
65108		61.5	40.0	12.9	43	56	1	47.2	82	4	4
65123		62.5	37.3	13.9	44	55	1	46.3	70 R	4	1
65134		63.0	36.6	14.2	45	54	1	46.0	83	3	4
6537		59.5	36.8	13.9	47	52	1	44.5	82	5	4
6538		60.5	37.2	14.2	55	44	1	45.1	70 R	4	1
6539		61.0	37.2	14.2	28	71	1	44.4	75	5	1

1/ Unofficial2/ 14% Moisture Basis3/ Unpurified4/ Below 80 color score not acceptable. R - Red.5/ Refer to Reference Mixograms for numerical curve pattern.6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.





TABLE 3  
QUALITY DATA ON DURUM WHEAT PRELIMINARY YIELD NURSERY SAMPLES

Pullman, Washington

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro. <u>2/</u>	Lg.	Med.	Sm.	<u>3/</u>	Score <u>4/</u>	<u>5/</u>	Eval. <u>6/</u>
Lakota	13335	61.5	36.1	12.9	42	55	3	43.9	83	5	
Penjamo 62		52.5	24.2	12.2	1	94	5	38.5	White	7	1
Sentry	13102	64.0	42.7	14.3	67	32	1	45.1	82	2	
Wells	13334	63.5	38.9	13.5	53	46	1	46.2	81	2	
Var. #2		57.0	32.4	14.2	3	94	3	40.0	80	5	1
Var. #3		54.5	27.9	13.9	1	87	12	36.5	80	6	1
Var. #4		57.0	35.2	13.7	10	89	1	41.7	80	4	1
Var. #5		54.5	28.9	13.5	4	89	7	40.0	85	7	1
Var. #6		55.0	29.2	13.9	7	88	5	40.0	83	6	1
Var. #7		56.0	28.7	13.7	2	94	4	41.4	93	5	1
X6401361		60.5	40.5	12.2	63	36	1	46.4	81	4	4
X6401401		60.5	43.9	13.2	62	37	1	45.5	81	6	3
X6301155		61.5	38.8	13.1	40	59	1	46.5	81	4	4
X6301309		61.5	42.9	13.6	55	44	1	44.2	81	5	4
X6301322		61.5	39.2	13.7	53	46	1	46.7	80	4	4
X6301404		62.0	41.5	13.7	57	42	1	45.8	80	4	4
X6301431		61.5	39.5	14.1	46	53	1	45.1	81	4	4
X6301619		62.0	39.1	14.0	57	42	1	46.3	82	3	4
X6301735		60.5	44.6	15.2	83	16	1	48.6	81	3	4
X6200755		61.5	31.1	14.2	25	72	3	45.0	81	6	3
X6301620		62.0	41.5	13.9	60	39	1	44.7	82	2	3
X6301473		63.5	43.3	13.1	63	36	1	46.6	83	4	4
X6301790		62.0	45.4	14.7	69	30	1	43.1	81	5	4
X6401364		61.0	36.0	12.9	56	42	2	43.2	82	5	3
X6401424		59.5	36.9	11.5	47	51	2	43.9	81	5	3
X6301018		63.0	37.9	13.2	53	46	1	45.5	80	3	3
D640047		63.5	44.4	13.9	74	25	1	41.8	81	7	3
X630036		65.0	46.0	14.5	76	24	0	44.0	83	2	3
X630033		64.5	47.6	14.6	73	26	1	44.8	82	2	3
X630020		62.5	41.5	16.1	58	42	0	44.7	83	3	4
X630017		64.0	36.9	13.2	34	65	1	44.4	88	4	3
X630016		63.0	35.6	12.8	31	69	0	44.7	88	4	3
X630010		61.5	41.7	14.2	52	48	0	40.9	83	4	3
X630012		62.5	41.0	14.3	67	33	0	42.4	81	4	4

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable.

5/ Refer to Reference Mixograms for numerical curve pattern.

6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



TABLE 4

## QUALITY DATA ON MINNESOTA UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		1/	Kwt.	Pro.	Lg.	Med.	Sm.	3/	Score	5/	Eval.
		#/Bu.	g.	%	%	%	%	%	4/		6/
<u>Crookston, Minnesota</u>											
Lakota	13335	61.5	33.1	12.1	13	82	5	44.1	81	8	
Leeds	13768	63.5	35.7	12.3	22	77	1	46.0	81	6	
Mindum	5296	64.0	36.9	10.7	44	53	3	49.4	70	6	
Stewart 63	13771	63.5	38.8	10.2	31	67	2	47.2	73	5	
Wells	13333	63.0	31.2	11.6	9	88	3	44.7	83	5	
61-48	13942	63.0	34.1	11.6	13	85	2	45.1	78	5	1
61-82		63.0	34.8	11.8	25	73	2	45.7	83	4	3
62-29		61.5	35.5	12.0	15	82	3	47.2	82	5	3
62-73		63.5	38.0	11.7	32	66	2	47.5	78	7	2
62-212		63.0	41.0	11.0	50	48	2	46.0	77	8	2
63-1		62.5	40.2	10.2	51	47	2	49.4	65	4	1
63-2		63.0	41.3	10.8	53	45	2	49.4	78	4	2
63-3		64.0	39.5	11.1	49	48	3	48.1	85	4	4
63-32		63.5	36.5	12.4	11	87	2	44.4	84	4	2
63-33		63.5	39.1	12.0	47	50	3	47.2	83	6	4
63-48		60.0	36.4	14.3	43	54	3	43.2	75 R	6	1
63-51		63.5	36.1	10.7	31	59	10	47.8	90	5	4
DT 184		62.0	39.4	10.8	43	54	3	50.3	79	4	2
DT 188		62.5	37.0	11.4	32	65	3	48.8	60	4	1
DT 191		62.5	41.8	10.8	46	53	1	48.1	78 R	7	1
<u>Morris, Minnesota</u>											
Lakota	13335	61.5	33.2	13.9	15	80	5	44.4	85	6	
Leeds	13768	63.0	37.9	15.6	18	79	3	45.7	93	3	
Mindum	5296	62.0	34.0	12.6	13	81	6	47.5	79	5	
Stewart 63	13771	62.5	35.6	14.3	6	89	5	47.2	75	6	
Wells	13333	62.0	30.6	13.9	5	86	9	46.3	83	4	
61-48	13942	61.5	34.8	14.8	10	85	5	46.0	77	6	1
61-82		64.0	36.8	14.0	18	80	2	46.9	81	3	3
62-29		61.0	36.2	15.1	17	77	6	46.9	78	3	1
62-73		64.0	37.7	14.1	33	64	3	47.8	73	6	1
62-212		63.0	40.0	13.7	30	66	4	44.8	83	6	3
63-1		62.0	38.8	13.4	34	63	3	47.9	80	4	3
63-2		61.0	36.6	14.4	19	76	5	47.2	85	4	4
63-3		62.5	37.5	14.5	26	70	4	46.9	83	5	4
63-32		63.0	35.8	14.8	7	90	3	44.1	81	5	2
63-33		62.5	39.7	14.4	39	56	5	46.9	82	5	4
63-48		58.5	39.2	18.2	43	54	3	44.1	81	5	2
63-51		61.5	35.6	13.9	23	71	6	47.8	91	4	4
DT 184		60.0	38.5	13.6	28	67	5	50.0	87	4	4
DT 188		62.0	35.1	13.1	23	71	6	49.7	70	4	1
DT 191		60.5	38.6	14.5	38	58	4	47.5	75	6	1

(CONT'D.)



TABLE 4 (Cont'd.)

## QUALITY DATA ON MINNESOTA UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.	<u>3/</u>	Score	<u>5/</u>	Eval.
		#/Bu.	g.	%	%	%	%	%	<u>4/</u>		<u>6/</u>
<u>St. Paul, Minnesota</u>											
Lakota	13335	59.0	27.0	17.0	5	85	10	42.1	85	6	
Leeds	13768	61.0	32.2	16.6	10	85	5	44.9	87	3	
Mindum	5296	61.0	33.8	15.6	22	72	6	48.6	70	4	
Stewart 63	13771	61.5	33.4	15.6	11	82	7	45.9	75	4	
Wells	13333	61.0	30.3	16.0	11	81	8	44.9	82	4	
61-48	13942	62.0	31.1	16.2	18	76	6	44.2	85	4	3
61-82		62.5	33.6	15.8	21	76	3	47.1	85	3	3
62-29		60.5	32.7	15.8	20	73	7	45.9	86	4	3
62-73		62.0	30.9	16.5	13	81	6	45.9	78	5	1
62-212		61.0	34.7	15.8	17	78	5	42.9	85	6	2
63-1		59.0	34.2	16.5	30	65	5	43.8	82	5	2
63-2		59.0	34.2	16.4	27	67	6	42.1	82	4	2
63-3		61.0	32.8	16.2	29	66	5	41.4	87	5	2
63-32		62.0	31.9	16.6	5	88	7	42.0	90	3	2
63-33		61.0	33.1	16.7	17	75	8	43.2	87	4	3
63-48		58.5	33.8	16.0	28	67	5	43.4	90	5	3
63-51		59.5	29.2	15.8	7	83	10	45.1	75	6	1
DT 184		58.0	31.9	15.6	16	76	8	45.4	85	6	2
DT 188		60.5	32.5	15.4	10	83	7	46.0	78	5	1
DT 191		59.5	36.5	15.7	24	71	5	45.1	80	7	2

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable. R - Red.

5/ Refer to Reference Mixograms for numerical curve pattern.

6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.

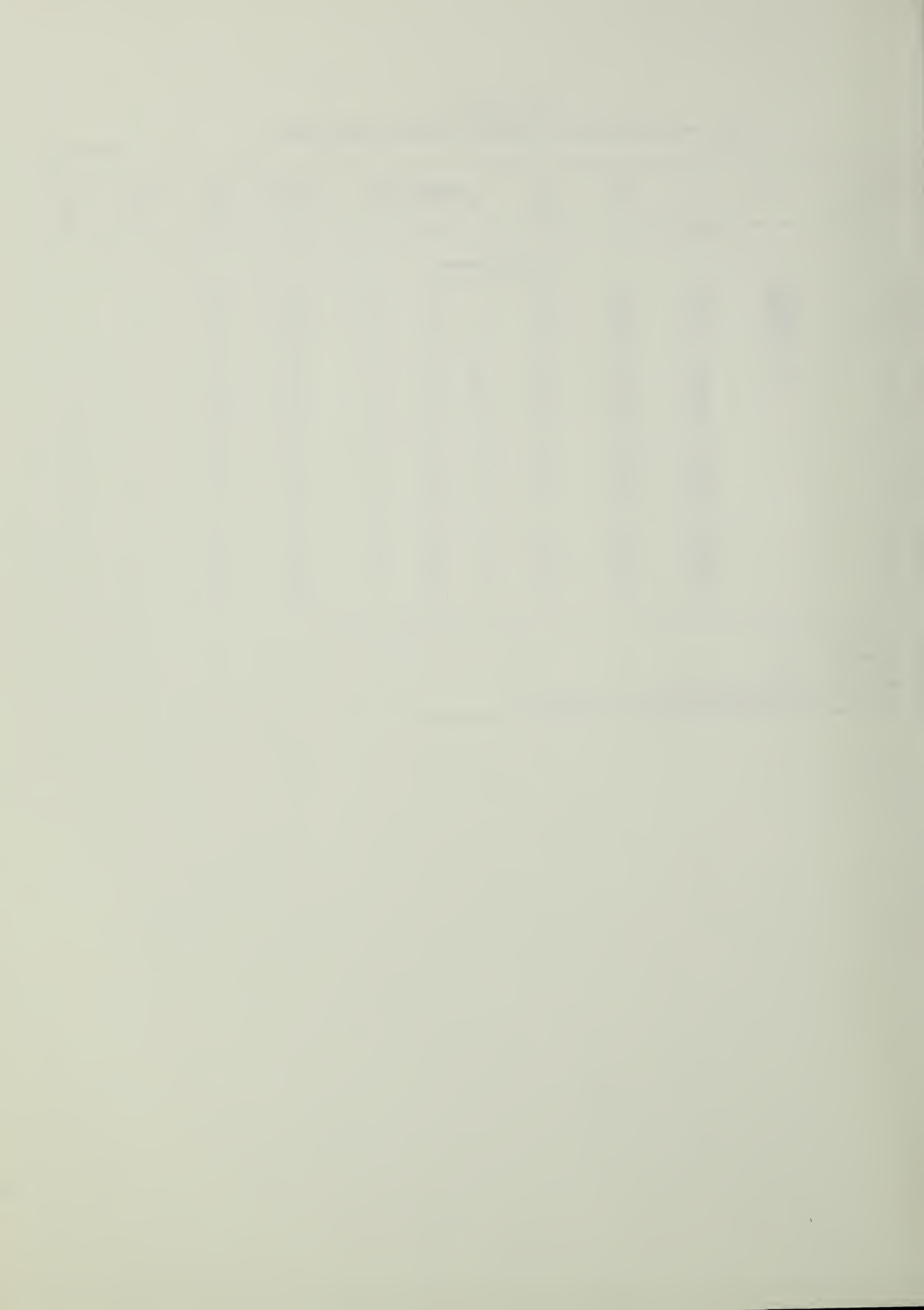




TABLE 5

## QUALITY DATA ON SOUTH DAKOTA UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
			Kwt.	Pro.	Lg.	Med.	Sm.		Score		Eval.
		<u>1/</u>		<u>2/</u>					<u>3/</u>	<u>4/</u>	<u>5/</u>
		#/Bu.	g.	%	%	%	%	%			
<u>Eureka, South Dakota</u>											
Lakota	13335	55.5	20.7	19.5	1	62	37	37.4	82	7	
Leeds	13768	61.0	29.4	17.6	3	88	9	42.7	84	6	
Mindum	5296	60.5	26.9	18.9	2	85	13	42.0	60	6	
Stewart 63	13771	59.0	26.7	19.5	1	80	19	40.6	65	5	
Wells	13333	57.0	22.9	18.4	1	73	26	41.9	85	5	
61-48	13942	60.5	27.0	18.1	1	86	13	43.6	75	6	1
61-82		63.0	32.6	17.2	6	90	4	45.4	85	4	4
62-29		58.5	28.5	17.6	2	85	13	45.0	81	5	3
62-73		61.5	29.3	17.3	2	85	13	44.4	78	6	2
62-212		61.0	27.0	17.7	2	88	10	42.1	81 B	7	2
63-1		57.5	27.5	18.3	1	86	13	42.9	83 B	7	2
63-2		57.0	28.3	18.0	1	85	14	43.7	85	7	3
63-3		59.5	28.7	18.1	2	85	13	42.9	84	7	3
63-32		61.0	30.0	17.6	1	86	13	41.7	85	5	4
63-33		60.0	29.1	18.2	1	94	5	42.4	84	5	4
63-48		56.5	29.2	19.3	7	84	9	40.6	84	6	4
63-51		59.5	26.2	17.2	2	83	15	42.1	86	6	4
DT 184		60.0	32.5	16.3	7	88	5	45.2	84 B	8	3
DT 188		59.5	28.0	17.8	3	82	15	43.7	79	6	2
DT 191		58.5	30.8	17.9	7	86	7	41.4	78	8	1
<u>Watertown, South Dakota</u>											
Lakota	13335	60.0	26.3	16.1	1	84	15	44.0	88	7	
Leeds	13768	63.0	33.0	16.6	5	90	5	45.2	87	3	
Mindum	5296	62.5	31.0	15.8	3	88	9	46.3	70	6	
Stewart 63	13771	62.5	34.6	16.5	3	92	5	45.4	70	5	
Wells	13333	61.0	25.5	16.1	2	81	17	43.7	81	5	
61-48	13942	63.0	33.0	16.5	5	91	4	44.9	79	6	2
61-82		63.5	35.1	16.3	5	92	3	45.4	80	4	3
62-29		60.5	30.2	16.3	2	88	10	46.5	80	5	3
62-73		65.0	31.4	16.4	5	90	5	44.9	77	6	1
62-212		62.5	34.7	16.2	5	92	3	43.3	81	6	3
63-1		61.5	32.7	16.5	9	86	5	45.6	80	6	3
63-2		61.5	33.2	16.4	7	88	5	46.0	80	5	3
63-3		62.5	34.2	16.3	13	84	3	44.4	81	6	3
63-32		62.5	33.2	16.4	3	92	5	43.3	82 B	4	3
63-33		63.5	34.7	16.1	15	81	4	44.4	81	5	3
63-48		60.5	35.7	18.2	25	72	3	44.4	79	6	2
63-51		62.0	31.2	15.9	5	89	6	43.5	88	5	3
DT 184		60.5	34.7	16.4	17	80	3	46.5	87	6	4
DT 188		62.5	31.5	16.2	6	88	6	46.3	75	6	1
DT 191		61.0	37.0	16.5	21	77	2	43.5	79	8	1

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable. B - Branny.

5/ Refer to Reference Mixograms for numerical curve pattern.

6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



TABLE 6

AVERAGE OF QUALITY DATA ON UNIFORM REGIONAL DURUM WHEAT NURSERY SAMPLES

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		1/ 2/	Kwt.	Pro.	Lg.	Med.	Sm.	3/	Score	5/	Eval.
		#/Bu.	g.	%	%	%	%	%	4/		6/
Minnesota											
Lakota	13335	60.6	31.1	14.3	11	82	7	43.5	84	7	
Leeds	13768	62.5	35.2	14.8	17	80	3	45.5	87	4	
Mindum	5296	62.3	34.9	13.0	26	69	5	48.5	73	5	
Stewart 63	13771	62.5	35.9	13.4	16	79	5	46.8	74	5	
Wells	13333	62.0	30.7	13.8	8	85	7	45.3	83	4	
61-48	13942	62.2	33.3	14.2	14	82	4	45.1	80	5	2
61-82		63.2	35.1	13.9	21	76	2	46.6	83	3	3
62-29		61.0	34.8	14.3	17	77	5	46.7	82	4	2
62-73		63.2	35.5	14.1	26	70	4	47.1	76	6	1
62-212		62.3	38.6	13.5	32	64	4	44.6	82	7	3
63-1		61.2	37.7	13.4	38	58	4	47.0	76	4	1
63-2		61.0	37.4	13.9	33	63	4	46.2	82	4	3
63-3		62.5	36.6	13.9	35	61	4	45.5	86	5	3
63-32		62.8	34.7	14.6	8	88	4	43.5	85	3	2
63-33		62.3	37.5	14.4	34	60	5	45.8	84	5	4
63-48		59.0	36.5	16.2	38	58	4	43.6	82	5	3
63-51		61.5	33.6	13.5	20	71	9	46.9	85	5	3
DT 184		60.0	36.6	13.3	29	66	5	48.6	84	5	3
DT 188		61.7	34.9	13.3	22	73	5	48.2	69	4	1
DT 191		60.8	39.0	13.7	36	61	3	46.9	78	7	1
South Dakota											
Lakota	13335	57.8	23.5	17.8	1	73	26	40.7	85	7	
Leeds	13768	62.0	31.2	17.1	4	89	7	44.0	86	5	
Mindum	5296	61.5	28.9	17.9	3	87	10	44.2	65	6	
Stewart 63	13771	60.8	30.7	18.0	2	86	12	43.0	68	5	
Wells	13333	59.0	24.2	17.3	2	77	21	42.8	83	5	
61-48	13942	61.8	30.0	17.3	3	89	8	44.3	77	6	1
61-82		63.3	33.9	16.8	6	91	3	45.4	83	4	3
62-29		59.5	29.4	16.9	2	87	11	45.8	81	5	3
62-73		63.5	30.4	16.9	4	87	9	44.7	78	6	1
62-212		61.8	30.9	16.9	4	90	6	42.7	81	7	2
63-1		59.5	30.1	17.4	5	88	9	44.3	82	7	2
63-2		59.3	30.8	17.2	4	87	9	44.9	83	6	3
63-3		61.0	31.5	17.2	8	84	8	42.7	83	7	3
63-32		61.8	31.6	17.0	2	89	9	42.5	83	5	3
63-33		61.8	31.9	17.2	8	87	5	42.4	83	5	3
63-48		58.5	32.5	18.8	16	78	6	42.5	82	6	3
63-51		60.8	28.7	16.6	4	86	10	42.8	87	6	3
DT 184		60.3	33.6	16.4	12	84	4	40.9	86	7	3
DT 188		61.0	29.8	17.0	5	85	10	45.0	77	6	1
DT 191		59.8	33.9	17.2	14	82	5	42.5	79	8	1
State Averages											
Minnesota		62.0	33.6	13.9	16	79	1	45.9	80	5	
South Dakota		60.2	27.7	17.6	2	83	15	42.9	77	6	
Averages for Minnesota and South Dakota											
1966 Crop Average		61.3	31.2	15.4	10	81	9	44.7	79	5	
1965 Crop Average		59.1	30.7	15.2	18	73	9	42.3	83	5	

1/ Unofficial

2/ 14% Moisture Basis

3/ Unpurified

4/ Below 80 color score not acceptable.

5/ Refer to Reference Mixograms for numerical curve pattern.

6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



TABLE 7

## QUALITY DATA ON DURUM WHEAT UNIFORM NURSERY SAMPLES

Moro and Pendleton, Oregon

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.	<u>3/</u>	Score	<u>5/</u>	Eval.
		#/Bu.	g.	%	%	%	%	%	<u>4/</u>		<u>6/</u>
<u>Moro, Oregon</u>											
Lakota	13335	63.0	30.5	8.8	31	62	7	50.0	65	6	
Langdon	13165	63.0	33.8	9.9	34	61	5	52.8	75	4	
Leeds	13768	64.0	36.6	10.3	26	72	2	52.4	82	3	
Stewart 63	13771	62.0	35.1	8.9	20	74	6	52.9	70	5	
Wells	13333	62.0	30.7	8.9	22	71	7	50.7	70	4	
58-312		63.5	33.2	9.4	16	77	7	51.9	70	5	2
58-321		62.5	34.0	8.3	26	67	7	52.9	65	3	1
61-82		64.0	40.8	11.5	48	50	2	50.9	78	3	3
62-73		63.5	40.0	8.8	51	46	3	53.8	65	5	1
63-1		62.5	42.4	9.2	51	45	4	53.1	70	4	2
63-51		63.5	36.2	8.9	30	65	5	51.0	82	4	4
<u>Pendleton, Oregon</u>											
Lakota	13335	63.5	37.5	11.2	34	62	4	45.0	85	5	
Langdon	13165	63.5	45.4	12.2	58	39	3	49.5	80	3	
Leeds	13768	64.5	40.7	12.6	54	45	1	48.8	85	2	
Stewart 63	13771	64.0	43.5	11.1	46	52	2	50.5	80	3	
Wells	13333	63.5	36.2	11.4	35	62	3	47.4	82	3	
58-312		63.5	37.0	11.5	30	67	3	49.5	80	4	3
58-321		63.0	36.0	9.6	32	63	5	51.2	78	3	2
61-82		64.0	42.7	13.6	60	38	2	47.6	86	2	3
62-73		65.0	40.7	12.0	53	44	3	49.3	81	5	3
63-1		63.5	43.3	11.5	62	35	3	48.8	82	4	4
63-51		64.0	40.0	11.5	50	47	3	50.0	88	4	4

1/ Unofficial2/ 14% Moisture Basis3/ Unpurified4/ Below 80 color score not acceptable.5/ Refer to Reference Mixograms for numerical curve pattern.6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.





TABLE 8  
QUALITY DATA ON SOUTH DAKOTA ADVANCED YIELD DURUM WHEAT NURSERY SAMPLES

Special Fertilizer Study

1966 CROP

Variety or State Sel. No.	C.I. No.	Test No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram
				Kwt.	Pro.	Lg.	Med.	Sm.		Score	
			<u>1/</u>		<u>2/</u>					<u>3/</u>	<u>4/</u>
			#/Bu.	g.	%	%	%	%	%		
<u>Brookings, South Dakota</u>											
<u>B Series</u>											
Lakota	13335	6/102	60.0	27.0	16.4	3	85	12	43.8	90	5
Leeds	13768	18/110	62.0	30.3	16.1	4	89	7	45.0	93	3
Stewart 63	13771	12/104	61.5	31.6	15.7	3	88	9	45.3	75	4
Wells	13333	5/113	61.5	27.9	15.9	3	87	10	44.7	84	4
<u>BK Series</u>											
Lakota	13335	6/314	61.5	29.5	14.0	14	79	7	46.3	81	5
Leeds	13768	18/210	63.5	36.6	14.8	31	66	3	48.4	82	4
Stewart 63	13771	12/410	62.0	35.8	13.8	22	73	5	48.4	70	5
Wells	13333	5/308	62.5	30.2	13.7	15	78	7	49.1	82	3
<u>Centerville, South Dakota</u>											
Lakota	13335	6/108	60.5	29.4	15.2	5	87	8	46.6	81	4
Leeds	13768	18/313	62.0	34.2	16.2	11	85	4	47.5	85	3
Stewart 63	13771	12/304	62.0	33.0	15.6	4	91	5	47.2	65	4
Wells	13333	5/206	61.5	27.5	15.3	3	88	9	46.0	83	3
<u>Eureka, South Dakota</u>											
Lakota	13335	6/106	56.5	23.0	19.2	1	74	25	42.6	79	6
Leeds	13768	18/105	61.0	29.7	18.3	1	90	9	45.0	85	3
Stewart 63	13771	12/111	58.5	27.2	20.0	1	82	17	44.1	70	6
Wells	13333	5/112	56.5	22.2	19.5	0	70	30	40.7	83	4
<u>Highmore, South Dakota</u>											
Lakota	13335	6/107	56.0	21.9	19.1	0	75	25	40.4	85	5
Leeds	13768	18/111	61.5	25.3	18.2	1	86	13	41.1	90	3
Stewart 63	13771	12/114	57.5	24.2	19.1	0	69	31	40.4	60 R	7
Wells	13333	5/101	56.5	20.2	18.9	0	61	39	39.1	88	3
<u>Watertown, South Dakota</u>											
<u>NE Series</u>											
Lakota	13335	6/114	59.5	28.0	16.7	1	86	13	46.0	82	5
Leeds	13768	18/107	62.5	33.6	17.2	1	96	3	46.3	81	2
Stewart 63	13771	12/103	62.0	32.7	16.4	2	91	7	47.8	75	4
Wells	13333	5/112	60.0	24.5	16.7	1	79	20	44.7	81	4
<u>W Series</u>											
Lakota	13335	6/102	60.5	27.9	17.0	1	91	8	43.1	84	5
Leeds	13768	18/107	62.0	30.0	16.1	3	93	4	45.9	87	3
Stewart 63	13771	12/117	60.0	33.3	16.5	3	92	5	45.9	70	5
Wells	13333	5/116	61.5	27.2	16.5	1	92	7	45.0	90	4

- 1/ Unofficial  
2/ 14% Moisure Basis  
3/ Unpurified  
4/ Below 80 color score not acceptable.  
5/ Refer to Reference Mixograms for numerical curve pattern.  
6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.



TABLE 9  
QUALITY DATA ON MONTANA ADVANCED YIELD DURUM WHEAT NURSERY SAMPLES

Irrigated and Dryland

1966 CROP

Variety or State Sel. No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Sem.	Pur.	Ash	Specks/ 10 Sq.In.	Sem.	Vis.	Farino.	Farino.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.	Pro.	Sem.			Abs.	Color	Rate	Abs.
		#/Bu.	g.	%	%	%	%	%	%	%		%	4/	5/	2/
<u>Bozeman, Montana (Irrigated)</u>															
Lakota	13335	58.8	27.9	16.3	4	81	15	15.3	56.2	.88	3	35.0	12.0	7	30.4
Leeds	13768	62.1	34.2	16.7	17	79	7	15.6	58.2	.94	13	33.7	11.5	2	27.8
Wells	13333	59.3	26.0	16.8	4	84	12	15.8	56.6	.92	3	34.7	11.0	4	29.2
<u>Creston, Montana (Dryland)</u>															
Lakota	13335	61.5	34.8	13.6	46	52	2	12.0	54.2	.60	7	35.3	10.0	6	28.9
Leeds	13768	63.5	43.1	15.4	72	26	2	13.8	59.6	.69	20	35.0	10.0	2	28.3
Wells	13333	62.3	33.8	14.0	43	52	5	12.5	57.2	.64	13	34.3	10.0	2	27.9
<u>Havre, Montana (Dryland)</u>															
Lakota	13335	62.7	36.5	15.6	34	62	4	14.2	57.2	.84	20	35.3	10.5	6	29.8
Leeds	13768	63.8	41.8	16.3	53	44	3	15.2	61.4	.76	17	34.3	10.5	2	28.1
Wells	13333	63.6	35.6	15.4	37	59	4	14.4	58.5	.62	7	33.0	9.5	3	27.5
<u>Huntley, Montana (Irrigated)</u>															
Lakota	13335	61.8	30.3	12.8	24	73	3	11.2	55.5	.67	20	35.7	10.5	6	28.3
Leeds	13678	63.6	39.2	13.4	55	41	4	11.9	58.0	.90	47	34.3	9.5	2	27.3
Wells	13333	62.2	29.0	12.8	17	74	8	11.7	57.8	.97	67	33.7	9.5	3	26.8
<u>Huntley, Montana (Dryland)</u>															
Lakota	13335	56.9	21.0	16.5	0	77	23	15.7	57.2	.92	3	34.3	11.0	6	29.9
Leeds	13678	60.0	25.6	16.1	0	90	10	15.2	59.8	.88	13	34.3	11.0	5	29.4
Wells	13333	57.7	20.9	16.4	0	79	21	15.6	58.1	.86	3	33.7	11.0	4	29.0
<u>Moccasin, Montana (Dryland)</u>															
Lakota	13335	57.2	20.9	17.2	0	73	27	15.8	53.4	.79	10	35.7	11.0	7	30.6
Leeds	13678	60.9	30.7	17.3	3	92	5	16.4	57.6	.84	3	34.7	11.0	2	29.1
Wells	13333	57.3	20.0	18.4	0	73	27	17.6	53.8	.92	3	34.0	11.0	4	30.2
<u>Sidney, Montana (Irrigated)</u>															
Lakota	13335	62.5	32.3	12.9	22	70	8	11.5	55.3	.61	17	34.3	9.5	6	27.5
Leeds	13678	64.1	39.5	13.4	56	42	2	11.8	56.7	.64	30	34.0	9.5	3	26.8
Wells	13333	63.2	30.8	12.7	23	70	7	11.3	57.2	.58	17	34.0	9.0	4	26.4
<u>Sidney, Montana (Dryland)</u>															
Lakota	13335	58.7	25.3	16.8	2	85	13	15.7	55.6	.75	13	35.3	11.0	7	30.5
Leeds	13678	61.6	31.2	16.9	4	95	1	15.9	56.3	.92	13	33.7	11.0	2	27.5
Wells	13333	60.6	25.8	16.9	2	86	12	15.7	56.6	.91	3	34.0	11.0	4	28.4

- 1/ Unofficial  
2/ 14% Moisture Basis  
3/ Purified  
4/ Below 8 color score not acceptable.  
5/ Refer to Reference Farinograms.



TABLE 10  
QUALITY DATA ON INTERNATIONAL DURUM YIELD NURSERY SAMPLES

Brookings, South Dakota

1966 CROP

Variety or Entry No.	C.I. No.	T.W.	1000 Kwt.	Wht. Pro.	Kernel Size			Semolina	Color Score	Mixogram	Gen. Eval.
		<u>1/</u>			Lg.	Med.	Sm.				
		<u>1/</u>		<u>2/</u>				<u>3/</u>	<u>4/</u>	<u>5/</u>	<u>6/</u>
		#/Bu.	g.	%	%	%	%	%			
Langdon	13165	60.0	32.4	14.5	7	86	7	45.4	81	3	
Lerma Rojo 64		60.0	38.8	17.5	19	79	2	45.0	White	4	
Oviachic		57.0	31.2	15.9	19	75	6	38.8	65 R	5	
Penjamo 62		59.5	30.6	14.0	17	80	3	45.4	White	4	
Tehuacan 60		60.5	41.0	16.7	47	49	4	46.3	75	6	
M66-3		59.5	31.2	15.0	15	76	9	45.1	60	4	1
M66-5		55.0	24.0	15.4	0	81	19	36.8	75 R	3	1
M66-7		58.5	35.7	15.3	33	63	4	43.9	78	2	2
M66-8		56.5	27.9	16.2	3	86	11	40.2	80	5	2
M66-9		59.5	34.0	16.0	11	82	7	42.3	70	8	1
M66-10		58.0	29.2	14.6	3	84	13	40.0	70	4	1
M66-11		58.5	34.0	16.5	30	67	3	43.0	75 R	6	1
M66-12		58.5	32.8	15.7	21	72	7	43.2	75 R	5	1
M66-14		58.5	34.0	15.9	22	69	9	43.6	75	3	1
M66-15		56.5	30.7	15.4	9	81	10	39.3	75 R	7	1
M66-16		58.0	28.2	15.3	3	84	13	39.0	81	5	2
M66-17		57.0	31.0	14.4	11	80	9	39.6	70	4	1
M66-18		55.0	35.5	16.4	33	61	6	38.4	70	5	1
II 8156		58.5	26.2	13.3	5	86	9	48.5	White	8	1
M66-20		58.0	39.2	15.3	9	83	8	41.0	70	5	1
M66-21		56.0	28.7	15.6	2	84	14	37.2	70	5	1
M66-22		59.0	38.2	14.8	38	57	5	42.1	82	3	3
Ld390		61.0	28.2	14.7	5	86	9	44.2	81	2	3
M66-25		60.0	30.8	14.4	7	77	14	40.6	79 R	3	1

- 1/ Unofficial  
2/ 14% Moisture Basis  
3/ Unpurified  
4/ Below 80 color score not acceptable. R - Red.  
5/ Refer to Reference Mixograms for numerical curve pattern.  
6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.





TABLE 11

## QUALITY DATA ON INTERNATIONAL DURUM YIELD NURSERY SAMPLES

Minot, North Dakota

1966 CROP

Variety or Entry No.	C.I. No.	T.W.	1000	Wht.	Kernel Size			Semolina	Color	Mixogram	Gen.
		<u>1/</u>	Kwt.	Pro.	Lg.	Med.	Sm.	<u>3/</u>	Score	<u>5/</u>	Eva 1.
		#/Bu.	g.	%	%	%	%	%	4/		6/
Langdon	13165	64.0	41.8	14.6	51	48	1	52.5	82	3	
Selkirk		60.5	33.4	16.2	39	60	1	55.3	White	8	
Lerma Rojo 64		62.5	40.3	17.9	63	36	1	43.7	White	3	
Oviachic		60.5	35.5	14.1	58	40	2	48.1	70 R	4	
Penjamo 62		61.5	34.6	13.3	47	52	1	45.2	White	4	
Tehuacan 60		63.5	49.5	14.9	77	22	1	47.9	79	8	
M66-3		60.5	33.0	13.6	42	56	2	44.9	75	6	1
M66-5		60.0	34.5	13.4	23	73	4	44.7	White	4	1
M66-7		60.5	43.9	13.1	74	25	1	46.1	77 R	2	1
M66-8		61.5	39.4	14.8	49	49	2	45.9	83	6	3
M66-9		62.5	36.8	13.7	23	74	3	44.7	75	8	1
M66-10		62.0	32.5	14.0	16	79	5	43.8	75 R	4	1
M66-11		61.0	37.7	14.5	59	40	1	47.5	78 R	8	1
M66-12		61.0	34.2	13.8	23	74	3	46.3	75 R	8	1
M66-14		59.5	45.2	15.3	68	31	1	47.9	70	2	1
M66-15		57.0	38.3	13.8	48	50	2	48.1	65	8	1
M66-16		61.5	36.0	14.9	19	78	3	47.7	84	6	3
M66-17		58.0	36.0	12.8	35	62	3	49.5	70	5	1
II 8156		63.0	30.3	12.7	27	69	3	52.6	White	8	1
M66-20		56.5	35.7	13.0	30	66	4	44.4	65 R	8	1
M66-21		58.0	32.1	14.5	11	84	5	44.7	70 R	8	1
M66-22		61.5	46.5	13.5	76	23	1	50.7	84	3	4
Ld390		62.5	34.2	14.4	31	66	3	49.5	83	3	3
M66-25		61.5	34.8	14.1	58	40	2	43.6	70 R	6	1

1/ Unofficial2/ 14% Moisture Basis3/ Unpurified4/ Below 80 color score not acceptable. R - Red.5/ Refer to Reference Mixograms for numerical curve pattern.6/ 1 - No Promise, 2 - Little Promise, 3 - Some Promise, 4 - Good Promise.





